

「Nikkei 225 Risk Control Index」

Index Guidebook

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Nikkei Inc.

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Nikkei 225 Risk Control Index

1 : Concept

The Nikkei 225 Risk Control Index is an index that tracks an investment strategy to control the level of fluctuation i.e. volatility of the Nikkei Stock Average (Nikkei 225) by keeping the volatility lower than a certain level, "Target volatility".

This index is designed to keep the volatility lower than the volatility of the Nikkei 225 itself by multiplying the Risk Control factor. The Risk Control factor is determined by the level of the Nikkei Stock Average Volatility Index (*1) for the past 20 business days.

While the calculation formula is as the same as that of the Nikkei 225 Leveraged Index and the Nikkei 225 Inverse Index (*2), this index is different in that the factor multiplying the fluctuation of Nikkei 225 is not constant and the factor changes corresponding to the market foresight of Nikkei 225 volatility.

In the past, there was a tendency that the Nikkei Stock Average Volatility Index rose sharply when the Nikkei 225 fluctuated widely, especially plunged. It would be effective to decrease the fluctuation of the Nikkei 225 Risk Control index compared to that of Nikkei 225 by lowering the Risk Control factor while the level of the Nikkei Stock Average Volatility Index is high.

*1 : For more detail about the Nikkei Stock Average Volatility Index, please refer to the "Nikkei Stock Average Volatility Index" Index Guidebook.

*2 : For more detail about the Nikkei 225 Leveraged Index and the Nikkei 225 Inverse Index, please refer to the "Nikkei 225 Leveraged Index" and "Nikkei 225 Inverse Index" Index Guidebook.

2 : Index Calculation

(1) Basic points

- Index value on a day is calculated by multiplying the index value on the previous day by the number based on the change rate of the current day of Nikkei 225 and the Risk Control factor.
- Unit of the index value is "points" and the figure is rounded to two decimal places.
- Index value on December 28, 2001 was 10,000 points.
- Index is calculated and published as the value on the end-of-day basis.
- Target volatility is 15.
- Minimum width of change in the Risk Control factor is 0.05.

(2) Formula

*In the following formula, "Nikkei 225" indicates its closing price.

$$\text{Index Value (current day)} = \text{Index Value (previous day)} \\ \times \left\{ 1 + \alpha \times \left(\frac{\text{Nikkei 225 (current day)}}{\text{Nikkei 225 (previous day)}} - 1 \right) \right\}$$

• α = Risk Control factor

(3) Definition of “Risk Control factor”

“Risk Control factor” is determined through the following steps;

- ① Obtain the “Observation value”, the maximum value of Nikkei Stock Average Volatility Index (the end-of-day basis) for the past 20 business days (from 21 business days before to the previous business day)
- ② Divide the target volatility (=15) by “Observation value” then the result, rounded to two decimal places is “Risk Control factor”.

③ However

- If width of change(*3), difference between the value calculated in the step ② and the “Risk Control factor” on the previous day, is below the minimum threshold (=0.05), the value calculated in ② is not adopted, and the “Risk Control factor” on the previous day continues to be used (When the Risk Control factor does not change so much, the value of the factor is kept at the same level as that on the previous day).
- The maximum of the “Risk Control factor” is 1. If “Risk Control factor” becomes over 1 as a result of the above calculation, the “Risk Control factor” on a day is set as 1.

*3 : Width of change indicates the absolute value of the difference between Risk Control factor on the previous day and that on the current day.

3 : Calculation example (in case of February 9, 2011)

* In a following example, “current day” is Feb 9, 2011 and, “previous day” is Feb 8, 2011.

- Nikkei 225 Risk Control Index (previous day)= 12376.99
- Risk Control factor (previous day)= 0.79
- Observation value(*4)= 19.41
- Risk Control factor (current day)= 0.79(*5)
- Nikkei 225 (previous day)= 10635.98
- Nikkei 225 (current day)= 10617.83

Nikkei 225 Risk Control Index (current day)

$$= 12376.99 \times \{1 + 0.79 \times (10617.83 \div 10635.98 - 1)\} = 12360.30442... \approx \underline{12360.30}$$

*4 : Maximum value of the Nikkei Stock Average Volatility Index between Jan 12 and Feb 8 in 2011 (both inclusive).

*5 : Risk Control factor is not changed on Feb 9, 2011 because width of change from the Risk

Control factor on the previous day to that on the current day (=0.02) is below 0,05, the minimum threshold.

4 : Treatment of the index value

(1)Retroactive calculation in the past

The Nikkei 225 Risk Control Index was calculated retroactively on the end-of-day basis; to December 28th 2001, base date of the index (=10,000 points). The Risk Control factor on the next day after the base date was determined based on the value of the Nikkei Stock Average Volatility Index from Nov 30 to Dec 28 in 2001.

(2)Modification of the index value

If the Nikkei Stock Average (Nikkei 225) or the Nikkei Stock Average Volatility Index used to calculate the Nikkei 225 Risk Control Index is modified retroactively, this index may also be modified retroactively.

5 : Others

(1) Licensing

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(2) Risk

Nikkei calculates and publishes the Nikkei 225 Risk Control Index in accordance with the methods described in this document. In the event of circumstance not described in this document or Nikkei determines it is impossible to use the methods described in this document, Nikkei may use an alternative method of the index calculation as it deems valid.

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In addition, the disclaimers in the above are also applied to Nikkei Stock Average (Nikkei 225) and Nikkei Stock Average Volatility Index used to calculate the Nikkei 225 Risk Control Index.

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